UNITED STATES ARMY AVIATION AND MISSILE COMMAND
Lifecycle Management Command

Processing of Tagnite Coated Magnesium Housings

Current Status

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Overview

- Who we are
- Current process at the Corpus Christi Army Depot (CCAD) for magnesium housings
- Tagnite goals
- Tagnite overview
- Current status of Army Aviation Tagnite programs supporting depot maintenance operations
- Summary and conclusions

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Who We Are

Army Aviation and Missile Command (AMCOM)

AMCOM G-4 Logistics

Environmental Division

Environmental Technology Integration Group (ETIG)

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Current Process at CCAD

- CCAD is the primary depot maintenance facility for a variety of Army aviation assets
  - Aviation assets that have seen service are sent to CCAD for overhaul and repair
- Helicopter assemblies containing mag housings are removed, disassembled, visually inspected, and based on the amount of damage:
  - stripped to substrate, inspected, and conversion coated per SAE-AMS-M-3171C, Type III or Type IV prior to the application of organic coatings.
  - Spot-stripped, non-destructively inspected, and spot-treated as necessary (Type VI, Chromic Acid Touch-up) prior to the application of organic coatings.
- Both pretreatment processes utilize hexavalent chrome containing materials

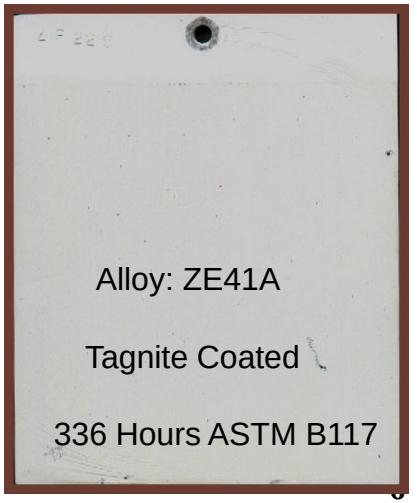
Goals

- **Eliminate processes that utilize hexavalent chrome during depot maintenance on magnesium housings**
- **Reduce attrition of magnesium housings due to corrosion.**
  - **Monetary savings from one main transmission housing each from AH-64, CH-47 and UH-60 will total approximately one million dollars in parts cost.**

What is tagnite?

- Tagnite is a magnesium oxide coating formed in an electrolytic cell and is classified as an anodize coating
- The coating system consists of Tagnite, followed by a layer of furnace cured epoxy known as Rockhard, and then primers and topcoats
- Replacement for the Dow class of hexavalent chrome-based surface treatments
- Generally regarded as providing superior corrosion resistance compared to hex-chrome coatings and also helps prevent galvanic attack


Tagnite Coated Housing



Tagnite Overview

- Use of Tagnite coated magnesium housings has been endorsed by the Aviation Engineering Directorate (AED)
- Tagnite coated aviation parts are currently being evaluated and in some cases being provisioned by the Army Aviation Community
  - Tagnite coated parts will eventually arrive at CCAD for overhaul and repair

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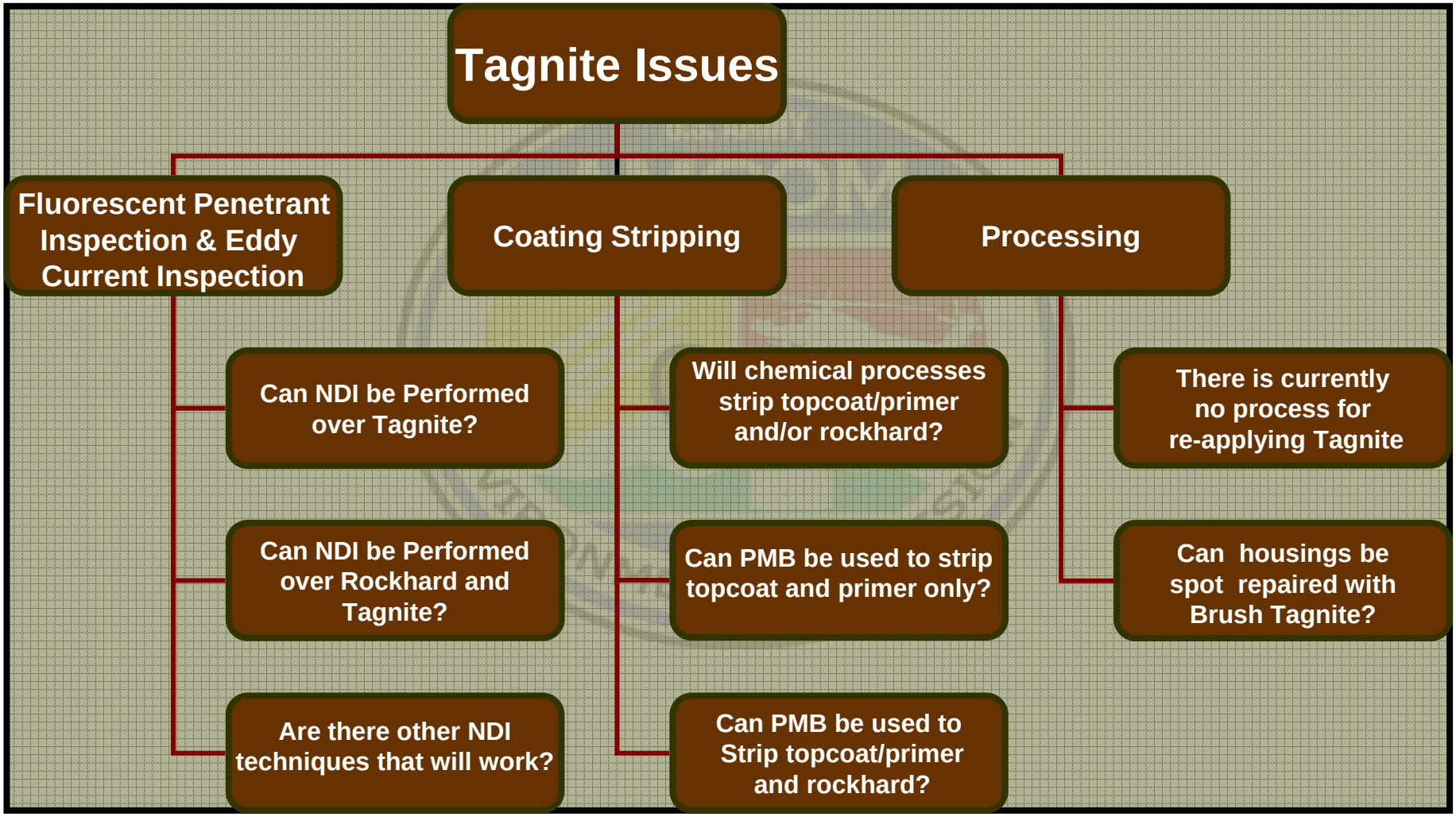
Depot Maintenance Operational Issues



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Demonstration/Validation Projects

- **Two projects have been submitted by ETIG to address the Tagnite processing issues at the depot:**
  - **The first project is "Demonstration/Validation of Processing Tagnite Coated Magnesium Housings"**
    - **This project was submitted to the National Defense Center for Environmental Excellence (NDCEE). It has now been funded and work is currently underway.**
    - **Demonstrate the following:**
      - **Strip magnesium housings of topcoat and primer while preserving the Rockhard and Tagnite**
      - **Strip of topcoat, primer and Rockhard while preserving only the anodized coating (Tagnite)**

- The second related project is “NDI Techniques for Rockhard/Tagnite and Tagnite Coated Magnesium Housings”
  - Submitted to the Army Environmental Quality Technology Program (EQT) and has now been funded
  - The project will evaluate Non Destructive Inspection (NDI) techniques to determine if component flaws to can be detected under Rockhard and Tagnite coatings overlaying magnesium" (leverage project from NDCEE)

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Current Status-Brush Tagnite (Touch Up)

- **Brush Tagnite**
- The Brush Tagnite spot-repair procedure has also been approved by AED Engineering for specific part numbers
  - further approvals are anticipated
  - procedure has been licensed for use at CCAD and equipment has been purchased.
  - CCAD operators will commence training shortly

Summary and Conclusions

- Although some issues remain regarding processing of Tagnite coated housings at the depot, it appears that the Aviation PMs are transitioning to this coating to enhance longevity of the magnesium components.
- Technical issues associated with processing Tagnite coated housings during depot maintenance operations must be resolved.
- Projects are now underway to address technical issues and identify a process for refurbishing Tagnite coated housings at the depot

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